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Agricultural Mechanization in Turkey

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Abstract

Turkey is one of the few countries in the World which are self-sufficient in food. Total tractor number was 1 125 001 for 2011. Number of tractor power ranged between 50-70 HP is 422 389. Total combine number is 14 313. 4148 of the are older than 20 years. This situation causes increasing harvesting losses. Number of the plough was 1 025 892. Farm trailers number was 1 074 764, sprayers 291 505, pneumatic sowing machine 27105, Cereals sowing machine 119 819, centrifugal spreader 371 771. Turkey's agricultural mechanization indicators are 56.25 tractor/1000 ha, 2.42 kW / ha, 17.78 ha / tractor, 444.65 tractor/1000 tract/ ha. Agricultural mechanization indicators of Turkey are better than their neighbours, except Greece. However, Turkey is behind the developed countries according to the agricultural mechanization indicators

There are 13 tractors manufacturer and more than 1000 agricultural machinery manufacturers in Turkey. Export of tractor and agricultural equipment and machinery in Turkey gradually increases and contribute to the economy of the country. Despite a strong Tractor manufacturers firms, there are many small agricultural machinery manufacturers. Agricultural mechanization problems may vary due to regions but main agricultural mechanization problems are; small scale and fragmented farming, unnecessary tractor and agricultural machinery selection, Lack of knowledge on effective and proper usage, maintenance of tractor and agricultural machineries and old combine and tractor Park. Agricultural mechanization policies of Turkey must help farmers to buy agricultural machineries which need less energy for improving yield and quality. In addition, control systems for preventing excessive inputs and yield monitors etc. will also be supported by policy makers to protect environment.

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1. Introduction

Agricultural Production is production of vegetable, animal, fishery, micro-organisms and energy by using agricultural inputs with soil, water, and biological sources (Anonymous, 2012). According to the data of 2011, there is mechanization requirement for all stages of agricultural production to feed the world's population is 6 973 billion (FAOSTAT, 2012). Agricultural mechanization refers to the use of the machine for agricultural production. According to another definition; agricultural mechanization is to use of modern agricultural machine instead of primitive tools, machinery, equipment and facilities (Ulger et al, 2011). Agricultural mechanization implies the use of various power sources and improved farm implements and machinery are used for different farm operations to increase productivity of land and labour through timeliness of operations, efficient use of inputs, and improvement in duality of produce, safety and comfort of farmers. and reduction in loss of produce and drudgery of farmer (<http1://>) Agricultural mechanization often follows various stages, starting from the use of mechanical power for power-intensive operations that require little control (such as milling, threshing, water pumping, or land preparation, followed by control-intensive operations (such as harvesting, weeding, and adapting farming systems and cropping patterns) to increased use of mechanically powered technologies, and technologies, and finally to automation of production (<http2://>).

2. Agricultural Mechanization Indicators in Turkey

Turkey is one of the few countries in the World which are self-sufficient in food. At present, Turkey is the largest producer and exporter of agricultural products in the Near East and North Africa. In fact, Turkey has traditionally been described as the world's food storehouse by many analysts. Such a huge agricultural sector has resulted in a strong agricultural machinery sector in Turkey (Kose, 2010).

Total tractor number was 1 125 001 for 2011. Number of tractor power ranged between 50-70 HP is 422 389. Total combine number is 14 313. 4148 of the are older than 20 years. This situation causes increasing harvesting losses. Number of the plough was 1 025 892. Farm trailers number was 1 074 764, sprayers 291 505, pneumatic sowing machine 27105, Cereals sowing machine 119 819, centrifugal spreader 371 771 (TUIK, 2012)

Number of tractors and agricultural tools and machinery in a country is an indicator of agricultural mechanization. However, these numbers makes sense when associated with cultivated land in that country

The most commonly used indicators of the level of agricultural mechanization are instrument/machine weight per tractors (kg / tractor), tractor power per cultivated area (kW / ha). Tool / Machine Number per tractor, number of tractors per cultivated 1000 hectares field (tractor/1000), cultivated area per tractor (ha / tractor) (DPT, 2001).

Turkey's agricultural mechanization indicators are 56.25 tractor/1000 ha, 2.42 kW / ha, 17.78 ha / tractor, 444.65 tractor/1000 tract/ ha. Agricultural mechanization indicators of Turkey are better than their neighbours, except Greece. However, Turkey is behind the developed countries according to the agricultural mechanization indicators. If these values examined for the regions, It can be seen that the Marmara and Aegean regions have the highest indicators of agricultural mechanization (Ozguven et al., 2010).

Ministry of Food, Agricultural and Livestock gives support farmers to buy agricultural machineries especially milking machines and irrigation systems. This support causes increasing agricultural mechanization indicators in Turkey for last decade.

There are 13 tractors manufacturer and more than 1000 agricultural machinery manufacturers in Turkey. Export of tractor and agricultural equipment and machinery in Turkey gradually increases and contribute to the economy of the country. Despite a strong Tractor manufacturers firms, there are many small agricultural machinery manufacturers.

At present the following products are in the product range of the Turkish agricultural machinery industry; farm tractors, engine single-axle hoes, engine mower machines, soil preparing/earth moving and seed bed

preparation machinery and equipment, seed drilling, sowing, seeding, transplanting machinery and equipment, plant protection and irrigation/sprinkling tools and equipment harvesting/reaping machines, threshing, drying, throwing, cleaning, classifying, processing etc. machinery, animal production machinery, other machineries for field and garden agricultural production. The main products exported are; tractors, harvesting and threshing machines, poultry keeping machine, machines for preparing animal feeds, ploughs, etc...(Kose, 2010)

3. Agricultural mechanization problems and solutions

Agricultural mechanization problems may vary due to regions but main agricultural mechanization problems are; small scale and fragmented farming, unnecessary tractor and agricultural machinery selection, Lack of knowledge on effective and proper usage, maintenance of tractor and agricultural machineries and old combine and tractor park.

Small scale and fragmented agricultural householders: Solution of this problem state is possible by following long term a policies and putting into practice required the necessary legal regulations. However, rather than ignore this small scale farmers, suitable agricultural mechanization systems must be developed for them.

Unnecessary tractors and agricultural machinery selection: Share of agricultural machinery expenses in total cost is higher than expenses of the all other agricultural inputs except field ownership. Farmers have to be careful when planning agricultural mechanization. A service or computer programme may develop for selection of agricultural machineries and tractor. This service may support by Ministry of Agriculture, Food and Livestock.

Lack of knowledge on effective and proper usage, maintenance of tractor and agricultural machineries: These cause energy and agricultural inputs cost. Farmers should be informed about this. Farmers should be trained on effective and proper usage, maintenance of tractor and agricultural machineries, controlled traffic, soil analysis, rate of seed, fertiliser and agricultural chemicals. Consequently excessive and unnecessary agricultural inputs will not be used and environment will be protected.

Old combine and tractor park: Using of old combines not only increase harvesting lost and but also maintained and operating costs. According to a study; 46 % percentage of our combine park are old (Evcim et al., 2010, Ulusoy et al., 2010). Exchanging of old combine and tractor completed economic life with new tractors and combines must be supported by government because of their price are so high.

Lack of Mechanization of orchard: There are still labour-intensive production in this sector. Agricultural machinery mostly used for tillage and spraying in orchards and vineyards. This situation has been started to change by establishing new modern orchards. Production of required agricultural machineries for orchard mechanization will be started to manufacture after starting farmers demand.

Future targets of the agricultural policy of Turkey may be focused on increasing cultivated area, decreasing man power in agricultural production, decreasing working time in agriculture, decreasing production cost, protecting natural resources must be target in the future (Evcim et al, 2010).

Turkey's agricultural mechanization policies will not support only increasing number of agricultural machineries and its usage to increase agricultural yield and production. Agricultural mechanization policies will help farmers to buy agricultural machineries which need less energy for improving yield and quality. In addition, control systems for preventing excessive inputs and yield monitors etc. will also be supported by policy makers to protect environment.

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